Abstract of the Disclosure

An NMR imaging process utilizes application of both a driven equilibrium technique and a fast- spin echo technique to acquire image. The fast-spin echo technique is a multiecho NMR imaging sequence, where different echoes are encoded differently to fill the ($k_x$, $k_g$) space at a speed of 1/*n* of the single echo speed, where *n* is the number of echoes in the multiecho sequence. During this echo train, a 90-degree RF pulse applied with proper phase at the center of any echo turns the magnetization back in the direction of the static magnetic field. Within a short waiting time after the 90-degree RF pulse, the spins are ready to be excited again. The multi-echo sequence has one 90-degree RF pulse at the beginning, followed by a series of *n* 180-degree RF pulses, followed by *n* echoes. A second 90-degree RF pulse is turned on exactly at the center of the *nth* echo, which returns all the magnetization left at this time to the static field direction. Only one frequency is used for excitation in acquiring the NMR signal in the single slice mode. Gradients are adjusted for oblique scanning. In the multislice acquisition mode, RF phases of different slices are different from one another and the final images can be constructed either by sharing the $k_g$ space or by using a transform process to separate the slices.